CLAIMS:

1. A system for testing an optical component, said system comprising:
   a) at least one first module capable of obtaining a respective first measurement of a characteristic of a spontaneously emitted signal that is supplied to the optical component;
   b) at least one second module, wherein each one of said at least one second module is associated to one of said at least one first module, said at least one second module capable of obtaining a respective second measurement of the characteristic of the spontaneously emitted signal for which a respective first measurement of the characteristic was obtained by its associated first module, the respective second measurement being obtained upon reception of the spontaneously emitted signal from the optical component;
   c) a processing module in communication with said at least one first module and said at least one second module for determining a feature of the optical component based on the first and second measurements.

2. A system as defined in claim 1, wherein said at least one first module includes a plurality of first modules and said at least one second module includes a plurality of second modules.

3. A system as defined in claim 2, wherein each second module from said plurality of second modules is

associated to a first module from said plurality of first modules by virtue of an associated connection path through the optical component, said processing module being capable of obtaining knowledge of all of the connection paths.

4. A system as defined in claim 3, wherein said optical component is a switch fabric.

5. A system as defined in claim 4, wherein said switch fabric is a photonic switch fabric.

6. A system as defined in claim 3, wherein the feature of the optical component determined by said processing module is the validity of a selected one of the connection paths.

7. A system as defined in claim 3, wherein the feature of the optical component determined by said processing module is the optical loss of a selected one of the connection paths.

8. A system as defined in claim 3, wherein said processing module is operative to:

a) evaluate a degree of similarity between the particular first and second measurements obtained by the first and second modules associated to a selected one of the connection paths;

b) determine the feature of the optical component on the basis of the degree of similarity evaluated in a).

9. A system as defined in claim 8, wherein said processing module is operative to:

a) determine a first feature when the degree of similarity is within a predetermined range;

b) determine a second feature when the degree of similarity is outside the predetermined range.

10. A system as defined in claim 9, wherein the degree of similarity is the value obtained by subtracting the particular second measurement from the particular first measurement.

11. A system as defined in claim 9, wherein said first feature is a valid selected connection path.

12. A system as defined in claim 11, wherein said second feature is an invalid selected connection path.

13. A system as defined in claim 3, wherein the characteristic of the spontaneously emitted signal measured by the first and second modules associated to a selected one of the connection paths is optical power, and wherein the feature of the optical component determined by said processing module is power loss across the selected connection path.

14. A system as defined in claim 13, wherein the processing module is operative to evaluate a degree of similarity between the particular first and second measurements obtained by the first and second modules associated to the selected connection path, the degree of similarity being indicative of the power loss.

15. A system as defined in claim 8, wherein the spontaneously emitted signal includes a modulation signature, the processing module being capable of:

a) determining a first modulation signature at the first module associated to a selected connection path;

b) determining a second modulation signature at the second module associated to a selected connection path;

c) comparing the first and second modulation signatures to establish a degree of similarity therebetween;

d) determining a successful communication over the selected connection path on the basis of the degree of similarity.

16. A system as defined in claim 8, wherein said processing module:

a) determines a first modulation signature at the first module associated to the selected connection path;

b) determines whether a second modulation signature is present at the second module associated to the selected connection path;

c) if the second modulation signature is present at the second module associated to the selected connection path and is equivalent to the first modulation signature, said processing module determines that there has been a successful connection over the selected connection path.

17. A system as defined in claim 16, wherein if the second modulation signature is present at the second module associated to the selected connection path and is different from the first modulation signature, said

processing module determines that there is a mistaken connection over the selected connection path.

18. A system as defined in claim 17, wherein if the second modulation signature is not present at the second module associated to the selected connection path, said processing module determines that there is a failed connection over the selected connection path.

19. A system comprising:

a) an optical component;

b) at least one first module capable of obtaining a respective first measurement of a characteristic of a spontaneously emitted signal that is supplied to said optical component;

c) at least one second module, wherein each one of said at least one second module is associated to one of said at least one first module, said at least one second module capable of obtaining a respective second measurement of the characteristic of the spontaneously emitted signal for which a respective first measurement of the characteristic was obtained by its associated first module, the respective second measurement being obtained upon reception of the spontaneously emitted signal from said optical component;

d) a processing module in communication with said at least one first module and said at least one second module for determining a feature of said optical component based on the first and second measurements.

20. A system as defined in claim 19, wherein said at least one first module includes a plurality of first modules and said at least one second module includes a plurality of second modules.

21. A system as defined in claim 20, wherein each second module from said plurality of second modules is associated to a first module from said plurality of first modules by virtue of an associated connection path through said optical component, said processing module being capable of obtaining knowledge of all of the connection paths.

22. A system as defined in claim 21, wherein said optical component is a switch fabric.

23. A system as defined in claim 22, wherein said switch fabric is a photonic switch fabric.

24. A system as defined in claim 21, further comprising a plurality of line cards, wherein said plurality of first modules and said plurality of second modules are distributed amongst said plurality of line cards.

25. A system as defined in claim 24, wherein at least one first module is embedded on one of said plurality of line cards.

26. A system as defined in claim 24, wherein at least one second module is embedded on one of said plurality of line cards.

27. A system as defined in claim 24, wherein at least one first module and at least one second module are embedded on one of said plurality of line cards.

28. A system as defined in claim 21, wherein the feature of said optical component determined by said processing module is the validity of a selected one of the connection paths.

29. A system as defined in claim 21, wherein said processing module is operative to:

a) evaluate a degree of similarity between the particular first and second measurements obtained by the first and second modules associated to a selected one of the connection path;

b) determine the feature of the optical component on the basis of the degree of similarity evaluated in a).

30. A system as defined in claim 29, wherein said processing module is operative to:

a) determine a first feature when the degree of similarity is within a predetermined range;

b) determine a second feature when the degree of similarity is outside the predetermined range.

31. A system as defined in claim 30, wherein the degree of similarity is the value obtained by subtracting the particular second measurement from the particular first measurement.

32. A system as defined in claim 30, wherein said first feature is the validity of the given connection path.

33. A system as defined in claim 30, wherein said second feature is the in-validity of the given connection path.

34. A system as defined in claim 21, wherein the characteristic of the spontaneously emitted signal measured by the first and second modules associated to a selected one of the connection paths is optical power, and wherein the feature of said optical component determined by said processing module is power loss across the selected connection path.

35. A system as defined in claim 34, wherein the processing module is operative to evaluate a degree of similarity between the particular first and second measurements obtained by the first and second modules associated to the selected connection path, the degree of similarity being indicative of the power loss.

36. A system as defined in claim 29, wherein the spontaneously emitted signal includes a modulation signature, the processing module being capable of:

a) determining a first modulation signature at the first module associated to the selected connection path;

b) determining a second modulation signature at the second module associated to the selected connection path;

c) comparing the first and second modulation signatures to establish a degree of similarity therebetween;

d) determining a successful communication over the selected connection path on the basis of the degree of similarity.

37. A system as defined in claim 29, wherein said processing module:

a) determines a first modulation signature at the first module associated to the selected connection path;

b) determines whether a second modulation signature is present at the second module associated to the selected connection path;

c) if the second modulation signature is present at the second module associated to the selected connection path and is equivalent to the first modulation signature, said processing module determines a successful communication over the selected connection path.

38. A system as defined in claim 37, wherein if the second modulation signature is present at the second module associated to the selected connection path and is different from the first modulation signature, said processing module determines a mistaken connection over the selected connection path.

39. A system as defined in claim 38, wherein if the second modulation signature is not present at the second module associated to the selected connection path, said processing module determines that there is a failed connection over the selected connection path.

40. A system as defined in claim 21, wherein at least one first module includes an optical tap for accessing the respective spontaneously emitted signal.

41. A system as defined in claim 40, wherein said at least one optical tap diverts a portion of the respective spontaneously emitted signal to an optical power monitor.

42. A system as defined in claim 41, wherein said optical power monitor obtains the first measurement of the characteristic of the respective spontaneously emitted signal associated to the at least one first module.

43. A system as defined in claim 42, wherein said optical power monitor includes a dynamic range of greater than 30 dB.

44. A system as defined in claim 43, wherein at least one second module includes an optical tap for accessing the respective spontaneously emitted signal.

45. A system as defined in claim 44, wherein said at least one optical tap diverts a portion of the respective spontaneously emitted signal to an optical power monitor.

46. A system as defined in claim 45, wherein said optical power monitor obtains the second measurement of the characteristic of the respective spontaneously emitted signal associated to the at least one second module.

47. A system as defined in claim 46, wherein said optical power monitor includes a dynamic range of greater than 30 dB.

48. An apparatus for testing an optical component, said apparatus comprising:

a) at least one first module capable of obtaining a respective first measurement of a characteristic of a spontaneously emitted signal that is supplied to the optical component;

b) at least one second module, wherein each one of said at least one second module is associated to one of said at least one first module, said at least one second module capable of obtaining a respective second measurement of the characteristic of the spontaneously emitted signal for which a respective first measurement of the characteristic was obtained by its associated first module, the respective second measurement being obtained upon reception of the spontaneously emitted signal from the optical component;

c) a processing module in communication with said at least one first module and said at least one second module for determining a feature of the optical component based on the first and second measurements.

49. An apparatus as defined in claim 48, wherein said apparatus is embedded in a line card.

50. An apparatus as defined in claim 48, wherein said apparatus includes a device that generates said spontaneously emitted signal.

51. An apparatus as defined in claim 50, wherein said device that generates said spontaneously emitted signal is an optical amplifier.

52. An apparatus as defined in claim 50, wherein said device that generates said spontaneously emitted signal is embedded in a line card.

53. An apparatus as defined in claim 48, wherein said apparatus receives said spontaneously emitted signal from an external source.

54. An apparatus as defined in claim 51, wherein said optical amplifier also functions to amplify a plurality of optical traffic signals that pass through said optical component.

55. A method for testing an optical component, comprising:

a) obtaining at a first module a respective first measurement of a characteristic of a spontaneously emitted signal supplied to the optical component;

b) receiving at a second module the spontaneously emitted signal from the optical component;

c) obtaining at a second module associated to the first module a respective second measurement of the characteristic of the spontaneously emitted signal for which a first respective measurement of the characteristic was obtained by its associated first

module, the respective second measurement being obtained upon reception of the spontaneously emitted signal from the optical component;

d) comparing the first and second respective measurements of the characteristic of the spontaneously emitted signal taken at the first and second modules to determine a feature of the optical component.

56. A system for testing an optical component, said system comprising:

a) an amplifier for supplying at least one spontaneously emitted signal to the optical component;

b) at least one module, wherein one of said at least one modules is capable of:

i) receiving from the optical component a respective spontaneously emitted signal; and

ii) obtaining a measurement of a characteristic of the respective spontaneously emitted signal;

c) a processing module in communication with said at least one module for determining a feature of the optical component based on the measurement obtained by said at least one second module.

57. A system for testing an optical component, said system comprising:

a) first means for obtaining a first measurement of a characteristic of a selected spontaneously emitted signal that is supplied to the optical component;

b) second means for receiving from the optical component the selected spontaneously emitted signal for which the first measurement of the

characteristic was obtained, and obtaining a second measurement of the characteristic of the selected spontaneously emitted signal;

c) processing means in communication with said first means and said second means for determining a feature of the optical component based on the first and second measurements.